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$$\therefore Q = \begin{vmatrix} 1, & -a_1^2, & -a_2^2, & -a_3^2, & \dots \\ 1, & s(s-2a_1), & 0, & 0, & \dots \\ 1, & 0, & s(s-2a_2), & 0, & \dots \\ 1, & 0, & 0, & s(s-2a_3), & \dots \\ \dots & \dots & \dots & \dots & \dots \end{vmatrix} \div \begin{vmatrix} 1, & -a_1, & -a_2, & -a_3, & \dots \\ 1, & s-2a_1, & 0, & 0, & \dots \\ 1, & 0, & s-2a_2, & 0, & \dots \\ 1, & 0, & 0, & s-2a_3, & \dots \\ \dots & \dots & \dots & \dots & \dots \end{vmatrix}$$

Let  $u = (s-2a_1)(s-2a_2)(s-2a_3)\dots(s-2a_n)$ .

$$\sum \frac{a_i^2}{s-2a_i} = \frac{a_1^2}{s-2a_1} + \frac{a_2^2}{s-2a_2} + \frac{a_3^2}{s-2a_3} + \dots$$

$$\therefore Q = \frac{s^{n-1} u \left\{ s + \sum \frac{a_i^2}{s-2a_i} \right\}}{u \left\{ 1 + \sum \frac{a_i}{s-2a_i} \right\}} = \frac{s^{n-1} \left\{ s + \sum \frac{a_i^2}{s-2a_i} \right\}}{\left\{ 1 + \sum \frac{a_i}{s-2a_i} \right\}}.$$

ERRATA. On page 52 of last issue, line 3 from bottom, read = before  $\frac{1}{c}$ , and in the denominator read  $\sqrt{a^2-x^2}$  for " $\sqrt{a^2+x^2}$ "; on page 53, line 15, extend the radical sign over  $a^2-x^2$  and  $b^2-x^2$ , in the numerators.

## PROBLEMS.

64. Proposed by A. H. BELL, Box 184, Hillsboro, Illinois.

Solve the equations:

$$a^2x = (2x^2 - a^2)\sqrt{x^2 + y^2} \dots (1).$$

$$b^2y = (2y^2 - b^2)\sqrt{x^2 + y^2} \dots (2).$$

65. Proposed by COOPER D. SCHMITT, A. M., Professor of Mathematics, University of Tennessee, Knoxville, Tennessee.

Prove that  $\cos \frac{n\pi}{7} + \cos \frac{3n\pi}{7} + \cos \frac{5n\pi}{7} = \frac{1}{2}$  or  $-\frac{1}{2}$ , according as  $n$  is odd

or even.